

SYLLABUS

Code: MATH 151

Title: INTERMEDIATE ALGEBRA

Institute: STEM

Department: MATHEMATICS

Course Description: This course prepares students for courses that require algebraic skills beyond those taught in Elementary Algebra. Topics include equations, inequalities, linear systems in two variables, complex numbers, and applications of functions: linear, exponential, logarithmic, quadratic, polynomial, rational, and radical. Problems are approached from a variety of perspectives, including graphical, numerical, verbal, and algebraic. A graphing calculator is required; the specific model is determined by the department.

Section Information: All tests will be proctored in person.

Prerequisites: MATH 025 or satisfactory completion of the college's foundational studies requirement in algebra.

Credits: 4

Lecture Hours: 4

Lab: 0

REQUIRED TEXTBOOK/MATERIALS:

See your instructor addendum for a complete list of required materials for your section.

- **Textbook:** The Brookdale Mathematics Department: MATH 151 Intermediate Algebra. This ebook is available for free online in your Canvas course.
- **Homework:** Online homework will be completed using the MyOpenMath platform, which is free to students.
- **Graphing Calculator:** The calculator for this course is the TI-83 (any version) or TI-84 (any version). The use of any other calculator should be discussed with the instructor. The TI-89 and TI-92 may not be used for testing.

ADDITIONAL TIME REQUIREMENTS:

OTHER TIME COMMITMENTS:

- In addition to the regular class hours, you will need to set aside time each week for homework. The weekly time will vary by topic and level of difficulty, but as an estimate, you should expect two homework hours for *each* class hour per week. For example, if your class meets for four hours per week, you should expect to spend about **eight** hours per week on homework.
- If you are having any difficulty with the course material, you may need to allow time to see your instructor during office hours or to get help in the Math Lab.

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COURSE LEARNING OUTCOMES:

Upon completion of this course, students will be able to:

- Demonstrate the mathematical skills appropriate to this course. (M)
- Identify and characterize the following functions: linear, exponential, logarithmic, quadratic, rational, and radical by interpreting verbal, graphical, numerical, and symbolic representations. (M)
- Use the appropriate function model to analyze and solve application problems. (M)
- Interpret solutions in the context of the problem. (M)
- Use a graphing calculator to understand concepts and to explore and solve problems. (M)

Learning Outcome(s) support the following General Education Knowledge Areas:

- (M) Mathematics

GRADING STANDARD: In this course, you will be evaluated by means of tests, quizzes, labs, and possibly homework.

A. TESTS

There will be four tests, one after each unit. Each test consists of two parts: a non-calculator part and a graphing calculator part. Students may not use any type of calculator on the non-calculator parts of the four tests. Tests will be cumulative. All supporting work must be shown on tests in order for your instructor to properly assess your understanding of the material. The tests will be given in class and it is expected that you will be in class to take the test on the day it is given. If you are very ill (verifiable with a doctor's note) or you have some other emergency, you must contact your instructor immediately.

Note: All tests will be proctored in person, see Instructor Addendum for more information.

B. LABS/QUIZZES/HOMEWORK

There are labs in this course to be completed in class. They are done in groups and may be assessed either individually or as a group assignment. The activities contain problems that reinforce the concepts and skills learned in class. There are also periodic quizzes, and your instructor may also choose to use homework assignments for evaluation.

GRADING

Each test is graded on the basis of 100 points. Your final course average is determined by a weighted average as follows:

| | |
|-------------------------|-----|
| Test 1 | 10% |
| Test 2 | 20% |
| Test 3 | 20% |
| Test 4 | 25% |
| Labs, Quizzes, Homework | 25% |

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FINAL GRADE

Your final grade is determined as follows:

| If your final course average is | Your final grade is |
|---------------------------------|---------------------|
| 90 – 100 | A |
| 88 – 89 | A- |
| 86 – 87 | B+ |
| 80 – 85 | B |
| 78 – 79 | B- |
| 76 – 77 | C+ |
| 70 – 75 | C |
| 60 – 69 | D** |
| Below 60 | F |

** To use this course as a prerequisite for another mathematics course, you must have a grade of C or better.

Incomplete

INC is only given at the discretion of your instructor. This may occur in documented cases of hardship or emergency. In this case, you must meet with the instructor to discuss the work that must be completed to earn a grade in the course. All work must be completed within 21 days after the end of the term, exclusive of official college closings.

Withdrawal

You may withdraw from the course, without penalty, up to a date set by the College. If you do not withdraw from the course but stop attending, your grade at the end of the semester will be F.

COURSE CONTENT: (TEXT SECTION)

Unit 1: In this unit, you will study functions, use function notation, and study linear functions and systems of linear equations in depth.

Unit 1 Outcomes: You will:

- Define a function. (2.1)
- Evaluate functions and use function notation. (2.1)
- Determine whether a graph or table represents a function. (2.1)
- Find slopes from tables and graphs. (2.3)
- Draw graphs of linear functions both by hand and with the graphing calculator. (Chapter 2)
- Represent linear models symbolically, graphically, and numerically. (2.2, 2.3, 2.4)
- Interpret the slope as a rate in the context of a problem situation. (2.3, 2.4)
- Solve application problems involving linear functions. (Chapter 2)
- Interpret linear solutions in the context of the application. (Chapter 2)
- Solve linear equations graphically, numerically, and symbolically. (3.1, 3.2)
- Solve linear inequalities graphically, numerically, and symbolically. (3.3)
- Solve compound inequalities graphically, numerically, and symbolically (3.4)
- Solve absolute value equations graphically, numerically, and symbolically. (3.5)

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- Solve systems of two linear equations graphically, numerically, and symbolically. (4.1, 4.2)
- Solve application problems by setting up and solving a system of two linear equations. (4.3)

Unit 2: In this unit, you will study polynomial and rational expressions and functions. You will solve polynomial and rational equations from a variety of perspectives: graphically, numerically, and symbolically.

Unit 2 Outcomes: You will:

- Define a polynomial expression and function. (5.1)
- Add and subtract polynomial expressions. (5.1)
- Identify which functions are polynomial functions. (5.1)
- Evaluate polynomial functions graphically, numerically, and symbolically. (5.1)
- Multiply polynomial expressions. (5.2)
- Factor polynomial expressions. (5.3, 5.4, 5.5, 5.6)
- Solve polynomial equations symbolically, graphically, or numerically. (5.7)
- Solve application problems involving polynomial functions, and interpret solutions in the context of the application. (5.1)
- Define a rational expression and a rational function. (6.1)
- Define a vertical asymptote. (6.1)
- Determine the equations of the vertical asymptotes of a rational function. (6.1)
- Multiply and divide rational expressions. (6.2)
- Add and subtract rational expressions. (6.3)
- Simplify complex fractions. (6.4)
- Solve rational equations graphically, numerically, and symbolically. (6.5)
- Analyze and solve application problems involving rational functions and interpret the results in the context of the problem. (Chapter 6)

Unit 3: In this unit, you will study the properties and applications of radical expressions and functions and quadratic functions. You will define complex numbers and perform calculations with them.

Unit 3 Outcomes: You will:

- Define square root and n th root expressions. (7.1)
- Review the properties of exponents. (7.2)
- Simplify, add, subtract, multiply, and divide radical expressions. (7.3, 7.4)
- Define the square and cube root functions, adding them to the “library” of functions. State their domains and ranges. (7.5)
- Solve application problems that involve square and cube root functions. (7.6)
- Interpret the results of radical problems in the context of the problem situation. (7.6)
- Solve equations involving radical expressions. (7.6)
- Define a complex number. (7.7)
- Add, subtract, multiply and divide complex numbers. (7.7)
- Recognize the graphs of quadratic functions. (8.1)
- Write a quadratic function in standard and vertex form. (8.2)
- Use the terminology (vertex, axis of symmetry) related to graphs of quadratic functions. (8.1, 8.2)
- Find the vertex and the equation of the axis of symmetry of a quadratic function. (8.1, 8.2)

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- Solve quadratic equations using a variety of techniques (factoring, square root property, completing the square, tables, and graphs). (8.3, 8.4)
- State and use the quadratic formula to solve quadratic equations. (8.4)
- Use the discriminant to determine the number of real number solutions to a quadratic equation. (8.4)
- Solve quadratic equations that have non-real solutions. (8.3, 8.4)
- Model application problems with quadratic functions and solve the related equations graphically, numerically, and symbolically. (Chapter 8)
- Interpret the results of quadratic problems in the context of the problem situation. (Chapter 8)

Unit 4: In this unit, you will study the properties and applications of exponential and logarithmic expressions and functions.

Unit 4 Outcomes: You will:

- Define an exponential function. (9.1)
- Determine whether a table could represent a linear or an exponential function (9.1)
- If a table represents an exponential function, find the growth or decay factor and write the function rule. (9.1)
- Apply previously studied concepts (domain, range) and new concepts (horizontal asymptote, growth and decay) related to exponential functions. (9.1)
- Define a logarithm. (9.2)
- Evaluate logarithms with and without a calculator. (9.2)
- Apply previously studied concepts (domain, range) and new concepts (vertical asymptote) related to logarithmic functions. (9.2)
- Use the properties of logarithms to simplify expressions. (9.3)
- Convert equations between exponential form and logarithmic form. (9.5)
- Solve exponential and logarithmic equations graphically, numerically, and symbolically. (9.4, 9.5)
- Model application problems with exponential or logarithmic functions and solve the related equations graphically, numerically, and symbolically. (Chapter 9)
- Interpret the results of exponential or logarithmic problems in the context of the problem situation. (Chapter 9)

DEPARTMENT POLICIES:

The Math Department wants you to be successful in this course. Because of this, we have compiled a list of strategies and behaviors.

Attendance and class participation

- If you want to be successful in this course, attend every class.
- Come to class on time, and stay for the entire class period. If you are late or leave during class, you will miss important class material and you will also distract your classmates and your instructor. (See the Student Conduct Code)
- Turn off your cell phone during class. You and your classmates need to be free from distractions. (See the Student Conduct Code)
- Bring your calculator to every class.

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- Respect your classmates and your instructor. Listen carefully to questions asked and answers given. Treat all questions with respect.
- Participate fully in class. Volunteer answers, work problems, take careful notes, and engage in discussions about the material. Above all, stay on task.
- Contribute your share of work to your in-class group work and do your best to make the group experience a positive one for all members.
- Do your own work on tests and quizzes. Cheating will not be tolerated. (See the Academic Integrity Code.)

Homework

- Homework is the way you practice the ideas and skills that are introduced in class. To be successful on the tests, you must do the homework. Homework may be collected and homework questions may be included on quizzes or tests. All the homework assignments are listed on WebAssign (see Required Materials).
- When you do the homework, write down all supporting work. Using the correct process is at least as important as getting the correct answer, so your work and steps are very important.
- Remember to check your answers.
- If there are questions you can't get or don't understand, ask about them at the beginning of the next class. If you have trouble with more than a few problems, try starting your homework in the Math Lab, where help is available.

Absence

- If you are sick and an absence is unavoidable, please call or email your instructor. You are still responsible for all material that was covered during your absence. You are expected to read the textbook and do the homework.
- Make time to see your instructor when you return so that you can get any papers you missed.
- Remember that you are expected to be in class for the tests and quizzes.

Getting Help

After you have tried the homework, there are ways to get help:

- Look in your text and your class notes for examples similar to the problems you are finding difficult.
- See your instructor during office hours or make an appointment. Bring the work you have done.
- Go to the **Math Lab** to get extra help on your homework or simply go and do your homework there. Someone will be there if you get stuck. You don't need an appointment to use the Math Lab.
- Form a **study group** with other class members. Working with other students can be a great way to learn. If you have a group to work with, consider meeting and working together in the Math Lab.
- You can use the computers in the computer lab within the Math Lab to do work related to your math course.
- In the Math Lab, you can get help on how to use your calculator.

Visit the [Math Lab website](#) to view hours and other useful information about the Math Lab.

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COLLEGE POLICIES:

As an academic institution, Brookdale facilitates the free exchange of ideas, upholds the virtues of civil discourse, and honors diverse perspectives informed by credible sources. Our College values all students and strives for inclusion and safety regardless of a student's disability, age, sex, gender identity, sexual orientation, race, ethnicity, country of origin, immigration status, religious affiliation, political orientation, socioeconomic standing, and veteran status. For additional information, support services, and engagement opportunities, please visit www.brookdalecc.edu/support.

For information regarding:

- ◆ Brookdale's Academic Integrity Code
- ◆ Student Conduct Code
- ◆ Student Grade Appeal Process

Please refer to the [BCC STUDENT HANDBOOK](#) AND [BCC CATALOG](#).

NOTIFICATION FOR STUDENTS WITH DISABILITIES:

Brookdale Community College offers reasonable accommodations and/or services to persons with disabilities. Students with disabilities who wish to self-identify must contact the Disabilities Services Office at 732-224-2730 (voice) or 732-842-4211 (TTY) to provide appropriate documentation of the disability, and request specific accommodations or services. If a student qualifies, reasonable accommodations and/or services, which are appropriate for the college level and are recommended in the documentation, can be approved.

MENTAL HEALTH:

- Mental Health Crisis Support: From a campus phone, dial 5555 or 732-224-2329 from an external line; off-hours calls will be forwarded to BCC police (2222 from a campus phone)
- Psychological Counseling Services: 732-224-2986 (to schedule an appointment during regular hours)

The syllabus is intended to give student guidance in what may be covered during the semester and will be followed as closely as possible. However, the faculty member reserves the right to modify, supplement, and make changes as the need arises.